

JUNCTION BOX

Related Application

[0001] This application is a continuation-in-part of United States Patent Application No. 10/294652, filed on 15 November 2002 and entitled "Junction Box".

Technical Field

[0002] The invention pertains to apparatus for housing electrical connections and/or other electrical components. Particular embodiments of the invention have application housing terminal connectors for telephone, cable television and/or other telecommunications lines.

Background

[0003] In the telecommunications industry, it is often necessary to electrically connect and/or reconfigure connections by way of which telecommunications signals are provided to subscribers. Such connections may have to be made or to be reconfigured to provide service to one or more subscribers in a building, a group of buildings or individual units within a building.

[0004] It is desirable to provide a plurality of relatively easily replaceable, interchangeable and reconfigurable connections in a single location (for a particular building, for example), such that connections and/or changes to connections may be made with a minimum effort. A device capable of providing one or more electrical connections is referred to herein as a "terminal connector".

[0005] There is a general desire to locate terminal connectors in weather resistant housings which may be conveniently located in outdoor locations, such that connections may be made, changed and/or

reconfigured by service technicians of telecom companies or other service providing organizations without having to enter buildings.

[0006] It may also be desirable to install such terminal connector 5 housings in a recess of a building wall between building wall layers. Such installation causes an interruption in the external layer(s) of buildings. If a recess is not adequately sealed, moisture may intrude into or between the layers of the building wall, damaging the building wall over time and eventually resulting in the need for repair or 10 replacement of the building wall. Moisture or other foreign material may also intrude past the housing into the building recess and possibly into the building itself. For these reasons, there is a general desire to provide housings which deter inward movement of and prevent or minimize the intrusion of moisture between building wall layers. It is 15 desirable that moisture or water accumulating between the housing and the wall be conveyed away from the housing past the most exterior wall layer.

Summary of the Invention

[0007] A junction box for receiving electrical cables and for 20 housing electrical components is disclosed. The apparatus comprises a base member and a lid member positionable over the base member to form an enclosure. The base member may have a recessed region and the lid member may be positionable over the recessed region of the base 25 member. The lid member and the base member may be coupleable on one side by one or more hinges. A plurality of concentric lower flanges may extend from a lower surface of the base member, such that a first cable conduit may be slidably engaged to one of the plurality of lower flanges. A plurality of concentric upper flanges may extend from an 30 upper surface of the base member, such that a second cable conduit may be slidably engaged to one of the plurality of upper flanges. One or

more upper knock-out elements may be located on the upper surface of the base member inside a diameter of the outermost one of the plurality of concentric upper flanges. The one or more upper knock-out elements may be removable from the base member to form an upper aperture

5 therein, such that a cable may extend from an interior of the second cable conduit through the upper aperture and into the enclosure.

[0008] The junction box may comprise a skirt flange for conveying, in an exterior direction, moisture on one or more surfaces

10 thereof. The skirt flange may be spaced apart from the lid member and may encircle a perimeter of at least one of the lid member and base member.

[0009] The skirt flange may comprise a bottom drainage flange

15 which projects downwardly and in an exterior direction from beneath the base member. The skirt flange may additionally or alternatively comprise a pair of side portions which project in an exterior direction from opposite sides of the base member and which extend upwardly from the bottom drainage flange. The side portions of the skirt flange

20 may extend upwardly from the bottom drainage at locations that are transversely inward of the opposing side edges of the bottom drainage flange. The skirt flange may additionally or alternatively comprise an upper portion which projects downwardly and in an exterior direction from above the base member and which may extend transversely

25 between the pair of side portions.

[0010] The bottom drainage flange may comprise one or more dams which project upwardly from an upper surface of the bottom drainage flange for limiting movement of moisture in a transverse

30 direction along the upper surface of the bottom drainage flange. The one or more dams may comprise a pair of dams which project upwardly

from opposite side edges of the bottom drainage flange for preventing moisture received on the upper surface of the bottom drainage flange from traveling transversely past the side edges of the bottom drainage flange.

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[0011] The bottom drainage flange may comprise a drip lip which projects more sharply downwardly than a remaining portion of the bottom drainage flange.

10 **[0012]** When the junction box is mounted within a building wall, the bottom drainage flange, the upper portion, or both the bottom drainage flange and the upper portion may project in an exterior direction past an exterior-most wall layer. When the junction box is mounted within a building wall having one or more wall layers, at least 15 one of the one or more wall layers may abut against at least a portion of the skirt flange.

20 **[0013]** The junction box may comprise a mounting flange for mounting the junction box between the layers of a building wall. The skirt flange may project in an exterior direction from the mounting flange. The mounting flange may project vertically, transversely, or both vertically and transversely from the base member. The mounting flange may be fastened to at least one wall layer and may extend between and substantially parallel to a pair of wall layers.

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[0014] Further features and applications of specific embodiments of the invention are described below.

Brief Description of the Drawings

30 **[0015]** In drawings which depict non-limiting embodiments of the invention:

Figure 1 is an isometric view of a junction box in a closed configuration according to a particular embodiment of the invention;

5 Figure 2 is an elevated plan view of a front side of the junction box of Figure 1;

Figure 3 is an elevated plan view of a back side of the junction box of Figure 1;

10 Figure 4 is an elevated plan view of the top of the junction box of Figure 1;

Figure 5 is an elevated plan view of the bottom of the junction box of Figure 1;

Figure 6 is an elevated plan view of a hinged side of the junction box of Figure 1;

15 Figure 7 is an elevated plan view of a clasp side of the junction box of Figure 1;

Figure 8 is an elevated plan view of the junction box of Figure 1 in an open configuration;

20 Figure 9 is a sectional view of a particular type of cable adapter mounted to the junction box of Figure 1;

Figure 10 is a partial isometric exploded view showing the clasp assembly of the junction box of Figure 1;

Figure 11 is an elevated plan view of the junction box of Figure 8 housing a first type of grounding bar;

25 Figure 12 is an isometric view of the junction box of Figure 11 housing a first type of terminal connector;

Figure 13 is an elevated plan view of the junction box of Figure 8 housing a second type of grounding bar;

Figure 14 is an isometric view of the junction box of Figure 13 housing a second type of terminal connector;

30 Figure 15 is an isometric view of a junction box in closed configuration according to another embodiment of the invention;

Figure 16 is an elevated plan view of a front side of the junction box of Figure 15;

Figure 17 is an elevated plan view of a back side of the junction box of Figure 15;

5 Figure 18 is an elevated plan view of the top of the junction box of Figure 15;

Figure 19 is an elevated plan view of the bottom of the junction box of Figure 15;

10 Figure 20 is an elevated plan view of a hinged side of the junction box of Figure 15;

Figure 21 is an elevated plan view of a clasp side of the junction box of Figure 15;

15 Figure 22 is an elevated plan view of the junction box of Figure 15 in an open configuration;

Figure 23 is an isometric view of a junction box in a closed configuration according to a further embodiment of the invention;

Figure 24 is an elevated plan view of a front side of the junction box of Figure 23;

20 Figure 25 is an elevated plan view of a back side of the junction box of Figure 23;

Figure 26 is an elevated plan view of the top of the junction box of Figure 23;

Figure 27 is an elevated plan view of the bottom of the junction box of Figure 23;

25 Figure 28 is an elevated plan view of a hinge side of the junction box of Figure 23 mounted between the layers of a building wall;

Figure 29 is an elevated plan view of a clasp side of the junction box of Figure 23 mounted between the layers of a building wall; and

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Figures 30A and 30B are isometric views of the junction box of Figure 23 incorporating circular flanges for mounting cable conduits.

5 Detailed Description

[0016] Throughout the following description, specific details are set forth in order to provide a more thorough understanding of the invention. However, the invention may be practiced without these particulars. In other instances, well known elements have not been 10 shown or described in detail to avoid unnecessarily obscuring the invention. Accordingly, the specification and drawings are to be regarded in an illustrative, rather than a restrictive, sense.

[0017] The invention disclosed herein relates to a junction box 15 apparatus for housing one or more terminal connectors and/or other electrical components. Although it may be used for a wide variety of applications, the junction box of the present invention is particularly well suited for housing surge protecting terminal connectors, which are widely used in the telecommunications industry. The junction box is 20 designed with a number of features making it suitable for outdoor use. Such features include: a locking clasp mechanism that simultaneously provides security for the junction box and dual accessibility to the junction box for both subscribers and service technicians; a terminal connector platform located on the junction box lid to provide easy 25 access to terminal connectors housed in the junction box, such that connections may be safely and easily made, changed and/or reconfigured; a plurality of "knock-out" apertures at various locations on the base of the junction box that provide access to the junction box for various types of cables and conduits; mounting features located on 30 the base of the junction box (i.e. away from the terminal connectors and/or other components) which permit the junction box to be mounted

to the outside of a building or other support structure, or between the layers of a wall of a building or other support structure, via a variety of fasteners; sealed cable entry and water drainage features that help to weatherproof the junction box and the terminal connectors and/or other

5 components housed therein; mounting features located on the base of the junction box which permit the junction box to be mounted within a recess of a building between wall layers; and water drainage features that help to convey moisture away from the building recess. These features may be provided individually or in any combination.

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[0018] Throughout the following description, the term "cable" is used to describe any wire, conduit, cable or the like which is capable of carrying electrical signals or power. As used in the following description, "cable(s)" may comprise one individual cable or a plurality

15 of individual cables. "Cable(s)" should also be understood to include fiber optic cables and pluralities of individual cables which may be grouped together and enclosed in a single sheath or conduit. In general, cables used to carry telecommunications signals comprise two individual cables, one of which is a ground cable and the other of which is a signal

20 carrying cable. In operation, the junction box of the present invention receives one or more cables and houses one or more terminal connectors (and/or other electrical components). Terminal connectors facilitate connections between the various cables received by the junction box.

25 [0019] Figures 1 through 7 depict various views of a junction box **10** according to a particular embodiment of the invention in a closed configuration. Figure 8 depicts junction box **10** in an open configuration.

30 [0020] When junction box **10** is in its closed configuration depicted in Figures 1 through 7, junction box **10** forms a substantially hollow, six

sided enclosure having a front side **14**, a back side **20**, a bottom side **16**, a top side **18**, a clasp side **12** and a hinge side **22**. Preferably, junction box **10** is made out of PVC, another plastic or another suitably non-conducting, waterproof and flame-retardant material.

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[0021] Throughout the following description, a number of conventions are employed to simplify the explanation of the invention. Where the invention comprises a plurality of similar elements, the individual elements are referred to using a reference numeral followed by a letter (for example, hinge **44A**) and the group of elements is referred to collectively using the reference numeral alone (for example, hinges **44**). The words "inward" and "inwardly" refer to a direction that extends from the outside of junction box **10** towards the interior of junction box **10**. Similarly, the words "outward" and "outwardly" refer to a direction that extends from the interior of junction box **10** towards the outside of junction box **10**.

[0022] Junction box **10** comprises a base member **24** and a lid member **26**, which are joined to one another on hinge side **22** by a plurality of hinges **44**. Hinges **44** facilitate pivotal movement of lid member **26** relative to base member **24**, such that lid member **26** may swing open from base member **24** on clasp side **12**. In the closed configuration of Figures 1 through 7, clasp assembly **70** may fasten lid member **26** to base member **24** on clasp side **12**. In the illustrated embodiment, the height and width of lid member **26** are slightly larger than the height and width of base member **24**, such that the edges **25** (Figure 8) of base member **24** fit slidably inside the edges **27** of lid member **26** and edges **27** of lid member **26** slidably overlap edges **25** of base member **24**. As shown in Figure 1, the recess inside base member **24** is relatively deep in comparison to that of lid member **26**.

[0023] Figure 3 depicts back side **20** of junction box **10**. Back side **20** comprises a plurality of mounting locations **46**, which may be used to mount junction box **10** to the wall of a building or other suitable support structure (not shown). Screws, bolts or other fasteners (not shown) may 5 extend from the inner surface **270** (Figure 8) of base member **24**, through apertures (not shown) in mounting locations **46** and into or through the support structure. Alternatively, screws, bolts or other fasteners may extend from the support structure, through apertures in 10 mounting locations **46** and into junction box **10**. Preferably, as shown in Figure 3, mounting locations **46** are elongated, such that fasteners 15 may be inserted through mounting locations **46** in a range of positions. Mounting locations **46** may comprise pre-threaded apertures to accept threaded fasteners. Preferably, mounting locations **46** are surrounded by stand-off flanges **42** (Figure 4) that extend outwardly from back side 20, such that when junction box **10** is mounted to a wall or other support structure, back side **20** of junction box **10** is separated slightly 25 from the support structure. This separation facilitates water drainage between backside **20** and the support structure. In the illustrated embodiment (Figure 3), junction box **10** is formed without apertures in mounting locations **46**. In such embodiments, if required, apertures 30 may be "knocked-out" of mounting locations **46** by driving fasteners through the body of junction box **10** or otherwise.

[0024] Back side **20** of junction box **10** comprises a circularly shaped back aperture **90** (Figure 3). Back aperture **90** facilitates direct access to the interior of junction box **10** for one or more cables (not shown). Typically, although not necessarily, such a cable extends from back side **20** of junction box **10** directly into the building or support structure to which junction box **10** is mounted. Back aperture **90** may 25 comprise a grommet (not shown) which extends around its circular edge, such that when an electrical cable is fed through back aperture **90**, 30

a seal is formed around the cable. Such a grommet may be made of rubber, silicone or other suitable materials. Preferably, the grommet is made of materials which are elastomeric and waterproof.

5 [0025] In the illustrated embodiment, back aperture **90** is not in use and, consequently, is filled with a removable plug **94**. Preferably, plug **94** is made out of a material or materials which are elastomeric and waterproof, such as rubber, silicone or plastic. When inserted, plug **94** provides a substantially waterproof seal with the circular edge of back aperture **90**. In some embodiments (not shown), plug **94** may be pierced to provide an aperture therein. When plug **94** is pierced in this manner, it may function as a grommet to form a waterproof seal around a cable inserted through back aperture **90**.

10 15 [0026] In other embodiments (not shown), plug **94** may be a "knock-out" element, which may be knocked or punched out from base member **24** to leave a corresponding aperture. A knock-out element, such as knock-out plug **94**, may be implemented, for example, by forming the walls of base member **24**, such that they have relatively thin regions which surround the desired shape of knock-out plug **94**. In this manner, knock-out plug **94** may be removed from base member **24** (if it is desired to run a cable through back aperture **90**) or, alternatively, knock-out plug **94** may be left in place in base member **24** to provide a waterproof wall.

20 25 [0027] In this description, an element referred to as a "knock-out" element, may be "knocked-out" or "punched out" from the body of junction box **10** to leave a correspondingly shaped aperture in base member **24** or lid member **26**. Such a knock-out element may be formed integrally with base member **24** or lid member **26** or may be a separate piece, which snaps into base member **24** or lid member **26**.

Such a knock-out element may be implemented, for example, by forming the walls of junction box 10, such that they have relatively thin regions which surround the desired knock-out element. In addition, the term "knock-out" is used in this description in conjunction with the

5 aperture which may be formed by a knock-out element. For example, in some embodiments, back aperture 90 may be a knock-out aperture, which is formed when circular knock-out plug 94 is removed from base member 24.

10 [0028] Referring to Figures 8 and 9, back side 20 of base member 24 may also incorporate an elongated knock-out element 272. Knock-out element 272 may comprise a semi-circular lower portion 274 and elongated sidewalls 276, which extend upward toward back aperture 90. In some embodiments (not shown) knock-out element 272 may actually

15 comprise a plurality of smaller knock-out elements. When plug 94 is knocked-out or removed from back aperture 90 and knock-out element 272 is knocked-out of base member 24, the resultant elongated aperture 283 in the back side 20 of base member 24 is shaped to facilitate connection to a particular type of telecommunications cable adapter 282.

20 As shown in Figure 9, cable adapter 282 receives a conduit 284 containing cable 286 and has its own enclosed space 288 in which cable 286 has an elbow 289. Elbow 289 causes cable 286, which enters cable adapter 282 from a certain location, to exit cable adapter 282 from a different, spaced apart location.

25 [0029] Back side 20 of base member 24 may also comprise a plurality of mounting holes 280 which may be used to mount cable adapter 282 to base member 24. Mounting screws, bolts or other fasteners 285 may be inserted between inner surface 270 of base

30 member 24 and cable adapter 282 through mounting holes 280. In the illustrated embodiment, mounting holes 280 are slightly elongated on

their vertical dimension (Figure 8) to provide for easier mounting. Mounting holes **280** may be knockout holes.

[0030] Inner surface **270** of base member **24** may comprise a brace **278**, which extends a small distance inwardly from inner surface **270**. In the illustrated embodiment, brace **278** is shaped and positioned to follow the perimeter of knock-out element **272** and back aperture **90** (Figure 8). Brace **278** may provide additional structural support to base member **24**, particularly when elongated aperture **283** is created by removing both knock-out element **272** and back aperture **90** from back side **20** of base member **24**.

[0031] As shown in Figure 8, terminal connector **290** may be mounted on the inner surface **270** of base member **24**. In the illustrated embodiment, terminal connector **290** is mounted to base member **24** using fasteners **292**, which extend from an inner side of terminal connector **290** into mounting holes **48** (Figures 12 and 14). Although the number of fasteners **292** and/or mounting holes **48** may vary in different embodiments, the illustrated embodiment includes four fasteners **292** and four associated mounting holes **48**. In the illustrated embodiment, mounting holes **48** comprise stand-off extensions **296** (Figure 14) that extend inwardly from inner surface **270** of base member **24**. Preferably, mounting holes **48** are threaded.

[0032] In the illustrated embodiment, fasteners **292A** and **292D** are threaded metallic shafts (which are partially inserted into mounting holes **48**) and nuts, which screw onto an inward side of the threaded shafts to hold terminal connector **290** in place. Additionally or alternatively, terminal fasteners **292** may be metallic screws which thread through terminal connector **290** into mounting holes **48**. See for example, fasteners **292B** and **292C**. In general, terminal connector **290** may be

mounted to base member 24 by any suitable means. Preferably, however, fasteners 292 are conductive, so that they may additionally be used to form connections on terminal connector 290.

5 [0033] Although mounting holes 48 and terminal connector 290 may be positioned at any suitable location on an inner wall of junction box 10, the location shown in the illustrated embodiment is preferable, because this location maintains a separation between terminal connector 290 and other cables, components and terminal connectors which may
10 be housed in junction box 10.

[0034] Terminal connector 290 includes a terminal bar 294, which extends between fasteners 292 and mounting holes 48. In typical applications, terminal bar 294 is a conductive grounding bar and extends
15 between all of fasteners 292, such that all of fasteners 292 are electrically grounded to terminal bar 294. In alternative embodiments, terminal bar 294 may be non-conductive or may comprise a plurality of smaller terminal bars, which are electrically isolated from one another.

20 [0035] Cables (not shown) may be connected to terminal connector 290 using a variety of connection means, such as screw connectors, crimp connectors, apertured connectors, "U-shaped" connectors and the like. In the illustrated embodiment, terminal connector 290 is shown with two screw on connectors 298. In general, however, connectors
25 298 may be any type of electrical connector.

[0036] Top side 18 of base member 24 comprises a substantially circular top knock-out aperture 50 (Figure 4), which may be used when cable access to junction box 10 is required through top side 18 of base
30 member 24. In the illustrated embodiment, top knock-out aperture 50 comprises two concentric, substantially circular flanges: outer flange

56 and inner flange **58**. Providing two flanges **56** and **58** permits conduits of different sizes to be mounted to box **10**. If cable access to junction box **10** through top side **18** of base member **24** is required, then a user may remove (i.e. knock-out) one or more knock-out elements **51** of knock-out aperture **50** that are located interior to outer flange **56**.

[0037] Preferably, the outer circumferential surface of outer flange **56** is sized to receive and slidably engage the inner circumferential surface of an industry-standard cable conduit (not shown). For example, the outer circumferential surface of outer flange **56** may be sized to receive the inner circumferential surface of a nominal 2" (50mm) cable conduit. Although 2" steel and PVC cable conduits are widely used in the telecommunications industry, cable conduits made out of almost any material may be mounted to flange **56**. The size of outer flange **56** may be varied to accommodate conduits of different sizes. Gravity and, possibly, frictional contact between the outer surface of outer flange **56** and the inner surface of the cable conduit, act to secure the conduit to junction box **10** and to provide a substantially waterproof seal. When knock-out element **51** of top aperture **50** is knocked-out, a cable may be extended from the cable conduit, through top side **18** of base member **24** and into junction box **10**.

[0038] Inner flange **58** is concentric with outer flange **56** and has an outer circumferential surface sized to receive and slidably engage the inner circumferential surface of a smaller-sized cable conduit (not shown). For example, the outer circumferential surface of inner flange **58** may be sized to slidably engage the inner circumferential surface of a nominal 1 1/4" (32mm) Schedule 40 PVC cable conduit. Typically, in the telecommunications industry, such 1 1/4" cable conduits are made from PVC, but cable conduits made from almost any material may be mounted to flange **58**. The size of inner flange **58** may be varied to

accommodate conduits of different sizes. Gravity and the frictional contact between the outer surface of inner flange 58 and the inner surface of the cable conduit act to secure the conduit to junction box 10 and to provide a substantially waterproof seal. When knock-out element 51 of top aperture 50 is knocked-out, a cable may be extended from the cable conduit, through top side 18 of base member 24 and into junction box 10.

[0039] Additionally, a grommet (not shown) may be provided around the perimeter of knock-out element 51 to form a seal around an inserted cable. Preferably, the grommet is elastomeric and waterproof to help prevent water from entering box 10 by way of top aperture 50.

[0040] Knock-out elements 51 of top aperture 50 may have different sizes to accommodate different thicknesses of cable. If the cable contained in a conduit is too thick to fit through inner knock-out element 51, then one or more additional knock-out elements may be removed from top aperture 50 to provide a larger aperture into junction box 10. For example, top aperture 50 may comprise a plurality of separate knock-out elements (not shown). A first, inner knock-out element (not shown) may be located interior to inner flange 58, such that when it is knocked out, both flanges 58, 56 are still present on base member 24. A second, larger knock-out element (not shown) may be located interior to outer flange 56, but exterior to inner flange 58. Such a larger knock-out element may be attached to inner flange 58, such that when the larger knock-out element is knocked out, inner flange 58 is removed from base member 24, forming a larger aperture into box 10.

[0041] Because top aperture 50 may be exposed to rain water, it is desirable to avoid having water or moisture pool on top surface 18 of junction box 10. When a cable conduit is engaged to the outer

circumferential surface of outer flange 56, water accumulation is not normally an issue, because water may simply drain away from top aperture 50. However, when a cable conduit is engaged to inner flange 58, water may tend to accumulate in the region between inner flange 58 and outer flange 56. For this reason, outer flange 56 includes a slot 60 that extends upwardly from the top side 18 of base member 24 to the rim of outer flange 56 (Figures 3 and 4). When a cable conduit is engaged to inner flange 58, slot 60 provides water drainage away from the region between inner flange 58 and outer flange 56. This drainage helps to prevent water from leaking into junction box 10 through top aperture 50.

[0042] In the illustrated embodiment, junction box 10 also comprises a circular top aperture cover 52 (Figure 1), which is sized to slidably and frictionally engage the inner circumferential surface of outer flange 56. Cover 52 prevents water accumulation on top side 18 of junction box 10. If knock-out element 51 of top aperture 50 has not been knocked-out, then cover 52 prevents water accumulation in the region inside inner flange 58. If knock-out element 51 of top aperture 50 was initially knocked-out and then, at some later point in time, it is desired to close top aperture 50 (because, for example, there is no longer any need to run cable into junction box 10 through top aperture 50), then cover 52 may be placed on top aperture 50 to prevent rainwater and other moisture from entering junction box 10. Top aperture cover 52 may comprise a lip 62, which extends in a radial direction atop outer flange 56. Lip 62 helps to move water away from top aperture 50, and facilitates easy removal of cover 52 from top aperture 50.

[0043] Bottom side 16 of base member 24 comprises a substantially circular bottom knock-out aperture 30 (Figure 5), which is

used when cable access to junction box **10** is required through bottom side **16** of base member **24**. In the illustrated embodiment, bottom knock-out aperture **30** includes three concentric, circular flanges: outer flange **38**, inner flange **36** and middle flange **37**. If cable access to

5 junction box **10** is required through bottom side **16** of base member **24**, then a user may knock-out a first knock-out element **33** from bottom knock-out aperture **30** and feed the cable through the resulting hole (not shown). Preferably, the first knock-out element **33** of bottom aperture **30** is located inside a diameter of inner flange **36**. A grommet (not

10 shown) may be used to form a seal around an inserted cable. Preferably, the grommet is elastomeric and waterproof, to prevent water from entering box **10** by way of bottom knock-out aperture **30**. In alternative embodiments, bottom aperture **30** may comprise a preformed first aperture (not shown) which is preferably located inside the

15 diameter of inner flange **36**. Such a preformed first aperture may be filled with a an elastomeric plug when not in use.

[0044] Preferably, the inner circumferential surface of outer flange **38** is sized to receive and slidably engage the outer circumferential surface of an industry standard cable conduit (not shown). For example, the inner circumferential surface of outer flange **38** may be sized to receive the outer circumferential surface of a nominal 2" (50 mm) PVC Schedule 40 cable conduit, which is widely used in the telecommunications industry. Cable from the cable conduit may be

20 inserted into junction box **10** through a removed knock-out element **33** of bottom aperture **30**.

[0045] The slidable engagement between the inner surface of outer flange **38** and the outer surface of the cable conduit may provide a

30 friction fit that helps to secure the cable conduit to flange **38**. Bottom aperture **30** also comprises a screw-hole **32**, which extends radially from

an outer circumferential surface of flange 38. To assist with securing the cable conduit to flange 38, fastening screw 34 (Figure 1) may be inserted through screw-hole 32 and flange 38 to bear against the outer surface of the cable conduit.

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[0046] Middle flange 37 is concentric with outer flange 38 and has an inner circumferential surface sized to receive and slidably engage the outer circumferential surface of a smaller-sized cable conduit (not shown). For example, the inner circumferential surface of middle flange 37 may be sized to slidably engage the outer circumferential surface of a nominal 1" (25 mm) PVC Schedule 40 cable conduit. Such 1" conduits are commonly used in the telecommunications industry. Cable from the cable conduit may be inserted into junction box 10 through a removed knock-out element 33 of bottom aperture 30.

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[0047] The slidable engagement between the inner surface of middle flange 37 and the outer surface of the cable conduit may provide a friction fit that helps to secure the cable conduit to middle flange 37. Middle flange 37 of bottom aperture 30 also comprises a partial slot 35 (Figures 5 and 14) that extends upwardly from the bottom rim of flange 37 partway through flange 37 toward bottom side 16 of junction box 10. When a cable conduit is slidably engaged to the inner circumferential surface of middle flange 37, fastening screw 34 may be inserted through screw-hole 32, outer flange 38 and partial slot 35 to bear against the outer surface of the cable conduit and to assist with securing the cable conduit to flange 37. Partial slot 35 may be implemented as a simple aperture (i.e. a screw hole).

[0048] Inner flange 36 is concentric with both outer flange 38 and middle flange 37 and has an outer circumferential surface sized to receive and slidably engage the inner circumferential surface of a

smaller-sized cable conduit (not shown). For example, the outer circumferential surface of inner flange 36 may be sized to slidably engage the inner circumferential surface of a nominal ¾ " (18mm) PVC Schedule 40 cable conduit, which is widely used in the

5 telecommunications industry. Cable from the cable conduit may be inserted into junction box 10 through a removed knock-out element 33 of bottom aperture 30.

[0049] The slidable engagement between the outer surface of inner flange 36 and the inner surface of the cable conduit may provide a friction fit that helps to secure the cable conduit to inner flange 36. In addition, when a cable conduit is slidably engaged to the outer circumferential surface of inner flange 36, fastening screw 34 may be inserted through screw-hole 32, outer flange 38 and partial slot 35 in middle flange 37. In this manner, screw 34 may be made to bear against the outer surface of the cable conduit to assist with securing the cable conduit to the outer circumferential surface of inner flange 36.

[0050] As discussed above, conduits mounted to flanges 36, 37, 38 of bottom aperture 30 may be made of PVC or steel, as is common in the telecommunications industry. However, conduits made from almost any material may be secured to flanges 36, 37, 38.

[0051] Knock-out elements 33 of bottom aperture 30 may have different sizes to accommodate different thicknesses of cable. If the cable contained in a conduit is too thick to fit through inner knock-out element 33, then one or more additional knock-out elements may be removed from bottom aperture 30 to provide a larger aperture into junction box 10. For example, bottom aperture 30 may comprise a plurality of separate knock-out elements (not shown). A first, inner knock-out element (not shown) may be located interior to inner flange

36, such that when it is knocked out, all flanges 36, 37, 38 are still present on base member 24. A second, mid-sized knock-out element (not shown) may be located interior to middle flange 37, but exterior to inner flange 26. Such a mid-sized knock-out element may be attached

5 to inner flange 36, such that when the mid-sized knock-out element is knocked out, inner flange 36 is removed from base member 24, forming a larger aperture into box 10. A third, large-sized knock-out element (not shown) may be located interior to outer flange 38 and exterior to middle flange 37. Such a large-sized knock-out element may be

10 attached to middle flange 37 (and possibly, to inner flange 36), such that when the large-sized knock-out element is knocked out, middle flange 37 (and possibly, inner flange 36) are removed from base member 24, forming an even larger aperture into box 10.

15 [0052] In the illustrated embodiment, bottom side 16 of base member 24 also includes one or more additional knock-out apertures 40A, 40B (Figure 5). When knocked-out, apertures 40 may be used to provide access to junction box 10 for additional cables and/or individual cables. Optionally, apertures 40 may be fitted with an elastomeric and

20 waterproof grommet (not shown) to provide additional protection from water and moisture entering the interior of junction box 10. In the illustrated embodiment, bottom side 16 of base member 24 also includes an aperture 41 for the drainage of moisture. Aperture 41 may comprise one or more knockout elements. In addition, aperture 41 may be

25 fabricated with a partially preformed aperture therein.

[0053] Hinged side 22 and clasp side 12 of base member 24 may have one or more additional knock-out side apertures 300, 302 (Figure 8) for admitting additional cables and/or cable conduits into junction box 10. For example, knock-out side apertures 300, 302 may be sized to receive 1" (25mm) cable conduits common in the telecommunications

industry. Knock-out side apertures **300, 302** may generally be sized to fit conduits of various sizes. After either side knock-out aperture **300, 302** is removed, its rim may be fitted with an elastomeric and waterproof grommet (not shown) which prevents moisture from entering

5 junction box **10**.

[0054] Locking clasp assembly **70** may be used to secure junction box **10** in its closed configuration (Figures 1 through 7) by securing base member **24** to lid member **26** on clasp side **12** of junction box **10**.

10 Locking clasp assembly **70** may include a plurality of security measures which are useful to facilitate independent access to the interior of junction box **10** by two independent people/organizations and to prevent unwanted vandalism or tampering with the contents of junction box **10**. Access for two different people/organizations is useful, for example, to

15 provide independent access to the service technicians of two different telecom (or other service) organizations technicians or to provide independent access to telecom (or other) service technicians and to telecom subscribers.

20 [0055] The components and operation of locking clasp assembly **70** are shown in Figure 10. Locking clasp assembly **70** comprises: a lid flange **72**, which extends outwardly from clasp side **12** of lid member **26**; a base flange **76**, which extends outwardly from clasp side **12** of base member **24**; and an intermediate clasp member **74**.

25 [0056] When junction box **10** is in its closed orientation, lid member **26** and base member **24** are brought together with intermediate clasp member **74** between the two. Intermediate clasp member **74** is fixed to base flange **76** by a locking screw **89** (Figure 8), which screws

30 from intermediate clasp member **74** into base flange **76** through a screw hole **86** (Figure 3). Preferably, as shown in Figure 8, locking screw **89**

has a head that requires a special key or tool to operate. Service technicians from the telecommunications company (or other service organization that owns, maintains or operates the components inside junction box 10) may be provided with copies of the special key or tool,

5 such that they are the only ones able to operate locking screw 89. Preferably, aperture 84 in lid flange 72 is sufficiently large to accommodate the head of locking screw 89, which protrudes through aperture 84 of lid flange 72, such that the head of locking screw 89 may be accessed with the proper key or tool. Hood extension 82 of lid

10 flange 72 helps to prevent people from tampering with locking screw 89.

[0057] In addition to being mounted to base flange 76, intermediate clasp member 74 may be fixed to lid flange 72 by a

15 conventional screw 88 (Figure 1). Screw 88 extends from lid flange 72 into intermediate clasp member 74 through screw hole 78. Clasp assembly 70 maintains junction box 10 in its closed orientation, because locking screw 89 secures intermediate clasp member 74 to base flange 76 and conventional screw 88 secures intermediate clasp member 74 to

20 lid flange 72.

[0058] In the closed orientation, a subscriber (or other user) may lock lid flange 72 to intermediate clasp member 74 by inserting a conventional key or combination padlock (not shown) through locking hole 80. The padlock prevents unauthorized entry into junction box 10, because it locks lid flange 72 to intermediate flange member 74. With locking screw 89 locking intermediate clasp member 74 to base flange 76, lid member 26 may not be separated from base member 24. When a subscriber (or other user) wants to access junction box 10, they simply

25 unscrew conventional screw 88 from screw hole 78 and remove their padlock from hole 80, detaching lid flange 72 from intermediate flange

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member **74**. In this manner, lid member **26** is allowed to swing away from base member **24**, leaving intermediate clasp **74** attached to base flange **76** via locking screw **89**.

- 5 **[0059]** A service technician (i.e. a second user) with the special key or tool required to operate the locking screw **89** may independently open junction box **10**, even though a lock has been placed through hole **80**. Using the special tool, the service technician may unscrew locking screw **89** through hole **84** in lid flange **72**, such that intermediate clasp member **74** may be separated from base flange **76**. In this manner, junction box **10** may be opened by separating lid member **26** from base member **24**, leaving intermediate clasp **74** attached to lid flange **72** by screw **88** and the padlock inserted through hole **80**.
- 10 **[0060]** The above described dual locking mechanism of clasp assembly **70** provides the advantage that junction box **10** is always locked and is secure from tampering. The dual opening mechanism of clasp assembly **70** is advantageous, because a first user (such as a subscriber) may independently access junction box **10**. Such access to junction box **10** may allow a subscriber to perform simple maintenance or minor changes to the connections in junction box **10** without requiring the presence of a service technician. The dual opening mechanism of clasp assembly **70** has the additional advantage that a service technician, may also independently access junction box **10** without requiring the subscriber to remove their lock from hole **80**. The service technician may then make more substantial changes or repairs to the connections and/or other components contained in junction box **10**. The dual independent access clasp assembly **70** may also permit dual independent access to technicians from two of more different service providing organizations, such as a telecom company and a cable company, for example.
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[0061] As depicted in Figure 8, a terminal connector platform **204** may be mounted to the inner surface **250** of lid member **26** by fasteners **206**. Fasteners **206** may be screws which screw into screw holes (not shown) formed integrally on inner surface **250** of lid member **26**.

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[0062] Junction box **10** may house various types of terminal connectors and/or other electrical components, which may be mounted on platform **204** or directly on inner surface **250** of lid member **26**. In the illustrated embodiment of Figure 8, terminal connector platform **204** 10 comprises a number of features designed to accommodate various types of terminal connectors or other components, which may be mounted thereon. These features are shown in Figures 11 and 12, which depict a first type of grounding bar **216** and a first type of terminal connector **200**, and to Figures 13 and 14, which depict a second type of grounding 15 bar **230** and a second type of terminal connector **202**. Typically (although not necessarily), terminal connectors, such as terminal connectors **200**, **202**, are provided by the telecommunications company or other service providing organization that owns and/or maintains junction box **10** and/or operates the services requiring junction box **10**.

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[0063] As shown in Figure 8, platform **204** may comprise a plurality of apertures **208**, which may be used for mounting various types of terminal connectors and/or other electrical components (not shown) to lid member **26** of junction box **10**. Apertures **208** may also 25 be used as additional or alternative mounting apertures through which fasteners (not shown) may extend to mount platform **204** to inner surface **250** of lid member **26**.

[0064] Platform **204** may also comprise a plurality of tie strap 30 brackets **241** (Figure 8), which may be used (in conjunction with tie straps) to restrain cables on the inside of junction box **10**. Preferably, tie strap brackets **241** are positioned at spaced apart locations on platform **204**.

[0065] Preferably, platform 204 comprises a screw hole 214, which is surrounded by a stand-off flange 212 that projects inwardly from platform 204 (Figure 8). Screw hole 214 and stand-off flange 212 5 may be used to mount and support different types of grounding bars. Such grounding bars may provide a common ground connection to terminal connectors housed in junction box 10.

[0066] Figure 11 depicts a first type of grounding bar 216 which is 10 used in conjunction with terminal connectors 200 of Figure 12. Referring to Figures 8 and 11, elevated section 217B of grounding bar 216 extends inwardly from the base of grounding bar 216 to fit over stand-off flange 212 and is mounted to stand-off flange 212 by a threaded fastener (not shown) inserted into screw hole 214. Grounding 15 bar 216 is also mounted to platform 204 by fasteners 220, which screw into screw holes 210 of platform 204.

[0067] As shown in Figures 11 and 12, grounding bar 216 comprises three elevated sections 217A, 217B, 217C, which extend 20 inwardly from the base of grounding bar 216. Terminal connectors 200 may be grounded and fastened to elevated sections 217 of grounding bar 216. Terminal connectors 200 may comprise metallic 25 mounting/grounding brackets 222, each of which may be fastened to an associated one of elevated sections 217 by fasteners (not shown). Such fasteners may comprise conventional metallic threaded studs and nuts. Additionally or alternatively, such fasteners may support other types of electrical connectors, such as tab connectors, screw connectors, crimp connectors and the like. In general, any type of electrical connector capable of connecting to the fasteners or connecting directly to 30 grounding bar 216 may be used.

[0068] In operation, telecommunications cables entering junction box 10 may be connected to one another by connecting their ground

wires to the common grounding bar 216 and by connecting their respective signal wires to connectors 224, 226 on either side of a terminal connector 200. In the illustrated embodiment, connectors 224, 226 are screw type connectors. In general, connectors 224, 226 may be 5 any type of electrical connector.

[0069] The location of terminal connectors 200 on lid member 26 of junction box 10 facilitates easy connection and changing of connections. When junction box 10 is opened terminal connectors 200 10 and their connectors 224, 226 stand out from inner surface 250 of lid member 26 rather than being recessed on the inside of base member 24. When junction box 10 is closed, terminal connectors 200 are housed in the relatively deep recess of base member 24.

[0070] Figure 13 depicts a second type of grounding bar 230, which is used in conjunction with the terminal connectors 202 of Figure 14. Referring to Figures 8, 13 and 14, platform 204 may comprise a slot 234 and a pair of brackets 236 located at either end of slot 234. Grounding bar 230 may be inserted into slot 234 in an orientation that is 20 substantially orthogonal to platform 204 and each end of grounding bar 230 may be inserted through a corresponding one of brackets 236. In this manner, slot 234 and brackets 236 help to secure grounding bar 230 in place on platform 204. Transversely extending tab 232 of grounding bar 230 extends over and is mounted to stand-off flange 212 by a 25 fastener (not shown), which may be threadably inserted into screw hole 214.

[0071] As shown in Figures 13 and 14, grounding bar 230 comprises a plurality of inwardly projecting members 238, one of which 30 corresponds with each terminal connector 202. Although the number of terminal connectors 202 and inwardly projecting members 238 may vary, the illustrated embodiment depicts six terminal connectors 202. Each of terminal connectors 202 has a grounding hood (not shown) on a

first end thereof. The grounding hood of each terminal connector 202 fits slidably over a corresponding one of inwardly projecting members 238 to form a friction fit with the inwardly projecting member 238. The friction fit between inwardly projecting members 238 and the grounding hood of terminal connectors 202 establishes the ground connection for terminal connectors 202 and assists in mounting the first end of terminal connectors 202 to platform 204. As best seen in Figure 13, platform 204 may comprise a plurality of apertures 240. Apertures 240 may be sized, positioned and shaped, such that specially designed legs (not shown) on a second end of terminal connectors 202 may project through apertures 240 and extend under platform 204 to secure the second end of terminal connectors 202 to lid member 26.

[0072] Each of terminal connectors 202 comprises two specialized connectors 242, 244 which may be specifically designed to receive the signal carrying wires of conventional telecommunications cables (not shown). In operation, telecommunications cables entering junction box 10 may be connected to one another by connecting their ground wires to the common grounding bar 216 and by connecting their respective signal carrying wires to specialized connectors 242, 244.

[0073] The location of terminal connectors 202 on lid member 26 of junction box 10 facilitates easy connection and changing of connections. When junction box 10 is opened, terminal connectors 202 and their connectors 242, 244 stand out from inner surface 250 of lid member 26 rather than being recessed on the inside of base member 24. When junction box 10 is closed, terminal connectors 202 are housed in the relatively deep recess of base member 24.

[0074] Figures 15-22 depict a junction box 10' according to an alternative embodiment of the invention. Junction box 10' is substantially similar to junction box 10 of Figures 1-14, except that junction box 10' is designed to be mounted in the interior of a wall.

Typically, although not necessarily, junction box **10'** is mounted to the interior of a wall during the wall's fabrication. As junction box **10'** is similar to junction box **10** (Figures 1-14), the features of junction box **10'** are depicted and referred to in this description using the same reference numerals as the similar features of junction box **10** followed by a "prime" symbol (').

5 [0075] Using fasteners **23'**, flanges **28A'**, **28B'** (collectively, **28'**) are respectively mounted to junction box **10'** on its clasp side **12'** and hinge side **22'**. Although fasteners **23'** are depicted as nuts and bolts, any suitable fasteners may be used to mount flanges **28'** to junction box **10'**. Junction box **10'** includes a pair of holes **29'** on each of clasp side **12'** and hinge side **22'**. Fasteners **23'** extend through flanges **28'** and holes **29'** to mount flanges **28'** to junction box **10'**. As shown in 10 Figures 20 and 21, holes **29'** may be elongated to provide positional adjustability for flanges **28'** and corresponding positional adjustability of junction box **10'** within a wall.

15 [0076] Flanges **28'** are provided for mounting junction box **10'** to the framework of a wall. A variety of mounting schemes are possible. For example, flanges **28'** may be fastened to the wooden or metal studs of a wall. Junction box **10'** may be oriented such that lid member **26'** opens towards the exterior of a building or lid member **26'** opens 20 towards the interior of a building. Flanges **28'** may be made of metal or other suitable materials.

25 [0077] Junction box **10'** comprises a top aperture **50'**, a bottom aperture **30'**, a back aperture **90'**, an elongated back aperture **272'** and a pair of side apertures **300'**, **302'**. Preferably, these apertures **50''**, **30''**, **90''**, **272''**, **300''**, **302''** are knock-out apertures and are substantially 30 similar to the corresponding knock-out apertures of junction box **10** described above. Each of these apertures may also comprise a plurality of knock-out elements, such that a variety of sizes of apertures may be

formed. In the illustrated embodiment of Figures 15-22, upper aperture **50'** and lower aperture **30'** are shown without concentric flanges **56, 58** and **36, 37, 38** which respectively surround upper aperture **50** and lower aperture **30** of junction box **10**. However, in alternative embodiments 5 (not shown), upper aperture **50'** and lower aperture **30'** may be constructed with concentric flanges that may be substantially similar and function in a manner that is substantially similar to concentric flanges **56, 58** and **36, 37, 38**.

10 [0078] Other features of junction box **10'** (Figure 22) may be substantially similar to the features of junction box **10** (Figures 8, 11-14). Accordingly, such features of junction box **10'** are not described further herein.

15 [0079] Figures 23-30 depict a junction box **10"** according to another alternative embodiment of the invention. Junction box **10"** is designed to be mountable between the layers of a building wall **522"**. For the purposes of describing junction box **10"** of Figures 23-30, the term "exterior direction" is used to refer to a direction which extends 20 from an interior of wall **522"** towards the exterior of wall **522"** (see arrow **556"** of Figures 28, 29) and the term "exterior-most" is used to refer to a portion of an object that extends the furthest in the exterior direction. Similarly, the term "interior direction" is used to refer to a direction which extends from an exterior of wall **522"** towards the 25 interior of wall **522"** (see arrow **558"** of Figures 28, 29) and the term "interior-most" is used to refer to a portion of an object that extends the furthest in the interior direction. Advantageously, as will be explained further below, junction box **10"** comprises a number of features 30 designed to deter movement of moisture in the interior direction, to prevent or minimize the intrusion of moisture between building wall layers and to convey moisture in the exterior direction away from junction box **10"** and past the exterior-most wall layer. As junction box **10"** comprises many features that are the same as or similar to features

of junction box **10**, the features of junction box **10''** are depicted and referred to in this description using the same reference numerals as the corresponding features of junction box **10**, followed by a "double prime" symbol ("').

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[0080] As shown in Figures 28, 29, junction box **10''** may be mounted between layers **522A''**, **522B''** of building wall **522''**, such that its base **24''** extends in an interior direction into a building recess **523''** and its lid **26''** opens in an exterior direction for access from an outdoor 10 location. Such outdoor access permits connections to be made, changed and/or reconfigured by service technicians of telecom companies or other service providing organizations without having to enter the building. Building recess **523''** may be an aperture (not shown), such that front side **14''** of junction box **10''** is accessible from the exterior of 15 the building and back side **20''** is accessible from the interior of the building. Typically, although not necessarily, junction box **10''** is mounted between the surface layers **522A''**, **522B''** of building wall **522''** during the wall's fabrication. External wall layer **522B''** may be a siding or cladding layer and internal wall layer **522A''** may be a 20 sheathing layer, for example. The illustrated embodiment of Figures 28, 29 depicts junction box **10''** installed in a vertical wall **522''**. In general, however, building wall **522''** may generally extend in any direction and need not be vertical. Accordingly, directional words used in this description should be given broad scope and not be interpreted 25 narrowly.

[0081] As best seen in Figures 23-25, base member **24''** of junction box **10''** comprises a mounting flange **534''** which is substantially planar and which projects vertically and transversely from 30 base member **24''** to form an outer perimeter of base member **24''**. Preferably, mounting flange **534''** is formed integrally with base member **24''** and is impervious to moisture so as to provide a barricade, which tends to prevent the flow of moisture in an inward direction

through wall 522". For example, mounting flange 534" and base 24" may be injection molded in the same process. Mounting flange 534" need not surround base member 24" entirely, but may alternatively comprise a number of spaced-apart flanges (not shown) which extend

5 vertically outwardly and/or transversely outwardly from base member 24". Mounting flange 534" preferably comprises a plurality of apertures 535A'', 535B'', 535C'', 535D'' (collectively, 535'') which penetrate mounting flange 534" at spaced-apart locations. Fasteners 536'' (Figures 28,29) may be inserted through apertures 535'' to mount

10 junction box 10" to one or both of layers 522A'', 522B'' of building wall 522". Although depicted as screws in Figures 28,29, fasteners 536'' may generally comprise any type of fastener, including, for example, rivets, nails, staples, or the like.

15 [0082] As shown in Figures 23-30, junction box 10" comprises a skirt flange 521". Skirt flange 521" projects in an exterior direction from mounting flange 534" and functions to convey moisture received on its surfaces away from building recess 523" and out from within building wall 522". Preferably, skirt flange 521" is spaced apart from

20 lid member 26" by a gap 505". Skirt flange 521" may encircle a perimeter of lid member 26", of base member 24", or of both lid member 26" and base member 24". Preferably, skirt flange 521" is formed integrally with mounting flange 534" and is impervious to moisture so as to provide a barricade, which tents to prevent the flow of

25 moisture in an inward direction through wall 522". For example, skirt flange 521" and mounting flange 534" may be injected molded in the same process.

30 [0083] In the illustrated embodiment, skirt flange 521" comprises an upper portion 538", a pair of side portions 539A'', 539B'' and a bottom drainage flange 524". Upper portion 538" projects downwardly and in an exterior direction from above base member 24", side portions 539A'', 539B'' are vertically oriented and project in an

exterior direction from opposite sides of base member 24'', and bottom drainage flange 524'' projects downwardly and in an exterior direction from beneath base member 24''. In the illustrated embodiment, upper portion 538'' and bottom drainage flange 524'' extend further in an

5 exterior direction than side portions 539''. Preferably, side portions 539'' are sized to allow pivotal movement of lid member 26'' relative to base member 24'' on hinges 44'' (Figure 24). Bottom drainage flange 524'' may be wider in the transverse direction than upper portion 538''. Bottom drainage flange 524'' may extend to the transverse edges of

10 mounting flange 534'', as shown in the illustrated embodiment. Side portions 539'' of skirt flange 521'' preferably extend upwardly from transversely inward locations on bottom drainage flange 524'' to meet upper portion 538'' of skirt flange 521''. In alternative embodiments, the transverse sides of bottom drainage flange 524'' may be vertically

15 aligned with side portions 539'' of skirt flange 521''.

[0084] Although Figures 23-30 show skirt flange 521'' as projecting in an exterior direction from mounting flange 534'', skirt flange 521'' may alternatively be attached to junction box 10'' directly, via a bracket, or by other suitable means. In other alternative embodiments, skirt flange 521'' may attach to building recess 523''.

[0085] As shown in the illustrated embodiment of Figures 23-30, bottom drainage flange 524'' may comprise dams 542'' that extend upwardly from the transverse sides of its upper surface. In some embodiments, dams 542'' may be provided at alternative and/or additional transverse locations. For example, dams 542'' may be located between side portions 539'' of skirt flange 521'' and the side edges of bottom drainage flange 524'' or dams 542'' may be vertically aligned with side portions 539''. As shown in Figures 23-30, bottom drainage flange 524'' may also comprise an outer drip lip 543'' at its exterior-most edge. Outer drip lip 543'' projects more sharply

downwardly than does the remaining portion of bottom drainage flange **524''**.

[0086] As shown in Figures 28, 29, junction box **10''** is preferably installed between layers **522A'', 522B''** of building wall **522''** during the building's construction. Preferably, junction box **10''** is installed in recess **523''** by mounting base member **24''** to internal wall layer **522A''** using fasteners **536''** which project through apertures **535''** in mounting flange **534''** and into one or both of wall layers **522A'', 522B''**. Fasteners **536''** may not require apertures **535''** and may simply be driven through mounting flange **534''**.

[0087] Those skilled in the art will appreciate that additional and/or alternative techniques may be used to mount base member **24''** to or between layers **522A'', 522B''** of building wall **522''**. Such alternative mounting techniques may include glue, sealant or friction fittings wherein a portion of base member **24''** is sized for a friction fit within building recess **523''**. When mounted according to any of these techniques, the substantially planar, vertically and transversely outwardly extending profile of mounting flange **534''** allows mounting flange **534''** to extend between and substantially parallel to layers **522A'', 522B''** of building wall **522''**.

[0088] Base member **24''** is typically mounted so that building recess **523''** surrounds the portions of its outer surfaces which are interior (see arrow **558''**) of mounting flange **534''**. When base member **24''** is mounted in this manner, the building may then be finished by applying one or more external wall layer(s) **522B''** over the exterior surface of internal wall layer **522A''**. Such external wall layer(s) **522B''** may comprise vinyl siding, wood siding or stucco, for example. External wall layer(s) **522B''** are preferably fabricated, such that, when installed, they extend over mounting flange **534''** and abut against skirt flange **521''**. More specifically, external wall layer(s)

522B'' may abut against the outer transverse surfaces of side portions **539''**, the upper surface of upper portion **538''** and/or the undersurface **544''** of bottom drainage flange **524''**. Upper portion **538''** and bottom drainage flange **524''** are preferably sized such that, after the

5 installation of external wall layer(s) **522B''**, upper portion **538''** and bottom drainage flange **524''** project in an exterior direction past the exterior-most extent of external wall layer **522B''**. Although not necessary for the effective working of the invention, outer drip lip **543''** of bottom drainage flange **524''** may be located in a portion of bottom

10 drainage flange **524''** which is located exterior of the exterior-most extent of external wall layer **522B''**.

[0089] In the illustrated embodiment, bottom drainage flange **524''** projects past the exterior-most extent of external wall layer **522B''**, thereby providing a mechanism for removing moisture from within building wall **522''** and directing moisture away from building recess **523''**. Moisture that is received on bottom drainage flange **524''** is directed downwardly and in an exterior direction by force of gravity past the exterior-most extent of external wall layer **522B''** to the outside of building wall **522''**. Dams **542''** limit the transverse movement of moisture and prevent moisture from escaping transversely from the sides of bottom drainage flange **524''**. Outer drip lip **543''** provides a drip edge to help prevent water droplets from accumulating on bottom drainage flange **524''**.

25 **[0090]** Moisture received on mounting flange **534''** may be directed downwardly to bottom drainage flange **524''**. Once received on bottom drainage flange **524''**, such moisture may be directed downwardly and in an exterior direction past the exterior-most extent of external wall layer **522B''** as described above.

[0091] Side portions **539''** of skirt flange **521''** and bottom flange **524''** work together to direct moisture out from within wall **522''** and

away from building recess 523''. When moisture is received on either side of side portions 539'', it is directed downwardly onto bottom drainage flange 524'', where it is directed downwardly and in an exterior direction past the exterior-most extent of external wall layer 522B'' as described above.

[0092] Upper portion 538'' of skirt flange 521'' also provides a mechanism for removing moisture from within building wall 522'' and directing moisture away from building recess 523''. When moisture is received on upper portion 538'' of skirt flange 521'', it may be directed by gravity downwardly and in an exterior direction past the exterior-most extent of external wall layer 522B'' to the outside of building wall 522''. In addition, moisture may travel transversely on upper portion 538'' of skirt flange 521'' until it reaches side portions 539'' of skirt flange 521''. Moisture reaching side portions 539'' of skirt flange 521'' will be directed downwardly to bottom drainage flange 524'' and then downwardly and in an exterior direction past the exterior-most extent of external wall layer 522B'' as described above.

[0093] Junction box 10'' comprises a top aperture 50'' (Figures 23 and 26), a bottom aperture 30'' (Figure 27), and a back aperture 90'' (Figure 25). Junction box 10'' may also comprise an elongated back aperture 272'' (not shown) and a pair of side apertures 300'', 302'' (not shown). Preferably, these apertures 50'', 30'', 90'', 272'', 300'', 302'' are knock-out apertures and are substantially similar to the corresponding knock-out apertures of junction box 10 described above. Each of these apertures may also comprise a plurality of knock-out elements, such that a variety of sizes of apertures may be formed. In the illustrated embodiment of Figures 23-29, junction box 10'' and its upper aperture 50'' and lower aperture 30'' are shown without concentric flanges 56, 58 and 36, 37, 38, which respectively surround upper aperture 50 and lower aperture 30 of junction box 10. However, in the illustrated embodiment of Figures 30A, 30B, upper aperture 50''

and lower aperture 30" are shown to comprise concentric flanges 56", 58" and 36", 37", 38". Concentric flanges 56", 58" and 36", 37", 38" may be substantially similar and function in a manner that is substantially similar to concentric flanges 56, 58 and 36, 37, 38.

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[0094] As best seen in Figures 25-29, junction box 10" comprises a hood 560" which provides a protective covering for a cable or cable conduit (not shown), which may be fed through bottom aperture 30" into junction box 10". Hood 560" comprises a hood top 562" which 10 extends downwardly and outwardly from back side 20" to a hood wall 564". In the illustrated embodiment, hood wall 564" has the shape of a partially cut-away cylinder, the curved surface of which extends outwardly from back side 20". Hood wall 564" extends vertically from hood top 562" down to hood bottom 566", which is located at the 15 bottom edge of back side 20" (Figure 27). Hood bottom 566" may be open-ended or may comprise one or more knock-out elements, such that a cable or cable conduit (not shown) may be fed through hood bottom 566" and bottom aperture 30" into junction box 10". In alternative embodiments (not shown), hood top 562", hood wall 564", and hood 20 bottom 566" may have other suitable shapes.

[0095] Other features of junction box 10" (not shown) may be substantially similar to features of junction box 10 (Figures 8, 11-14). Accordingly, such features of junction box 10" are not described 25 further herein.

[0096] As will be apparent to those skilled in the art in the light of the foregoing disclosure, many alterations and modifications are possible in the practice of this invention without departing from the 30 spirit or scope thereof. For example:

- Terminal connector platform 204 is not required by the invention. The features of platform 204, such as stand-off flange 212, screw

hole 214 and apertures 240 for example, may be formed integrally on inner surface 250 of lid member 26.

- 5 • The illustrated terminal connectors 200, 202 of Figures 12 and 14 comprise surge protection modules commonly used in the telecommunications industry. However, those skilled in the art will appreciate that many variations of terminal connectors could be mounted to platform 204 or mounted directly on inner surface 250 of lid member 26. In general, the specific terminal
10 connectors used inside junction box 10 may be varied without departing from the invention. The invention should be understood to accommodate any type of suitable terminal connector that may be mounted on a terminal connector platform or directly on inner surface 250 of lid member 26.
- 15 • In addition to terminal connectors, various other types of electrical components may be housed in junction box 10. Such other components may include, for example: capacitors, switches, relays, ADSL splitters, HDSL splitters, circuit boards, amplifiers, cable splitters and routers.
- 20 • If junction box 10 houses different types of terminal connectors (i.e. terminal connectors different from terminal connectors 200, 202 of Figures 13 and 14) or other electrical components, junction box 10 may require a modified platform 204. Those skilled in the art will appreciate that there are many implementations of platform 204, which may be employed to house alternative or additional terminal connectors or electrical components.
- 25 • Locking clasp assembly represents a preferred embodiment of how base flange 76 and lid flange 72 may both be independently locked to, and unlocked from, intermediate clasp member 74.
- 30 •

Other embodiments are possible. For example, locking screw **89** may be replaced by a conventional screw having a locking pin that may be inserted through its tip to lock intermediate clasp member **74** to base flange **76**.

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- Although junction box **10** has been depicted and described as having a dual-locking clasp assembly **70**, dual locking clasp assembly **70** is not necessary. Junction box **10** may include a conventional single locking clasp or a non-locking clasp.

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- Similar alterations and modifications as those discussed above may be made to junction box **10'**, to junction box **10''**, and to their respective components.

15

[0097] Accordingly, the scope of the invention is to be construed in accordance with the substance defined by the following claims.